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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/711,885 | 10/12/2004 | Timothy H. Daubenspeck | BUR920040144US1 | 5884 |

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| EXAMINER | |
|---|---|
| GETACHEW, ABIY | |
| ART UNIT | PAPER NUMBER |
| 2841 | |

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
|---|---|---|
| 3 MONTHS | 04/26/2007 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/711,885 | DAUBENSPECK ET AL. | |
| | Examiner | Art Unit | |
| | Abiy Getachew | 2841 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *26 January 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-14 and 21-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14 and 21-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

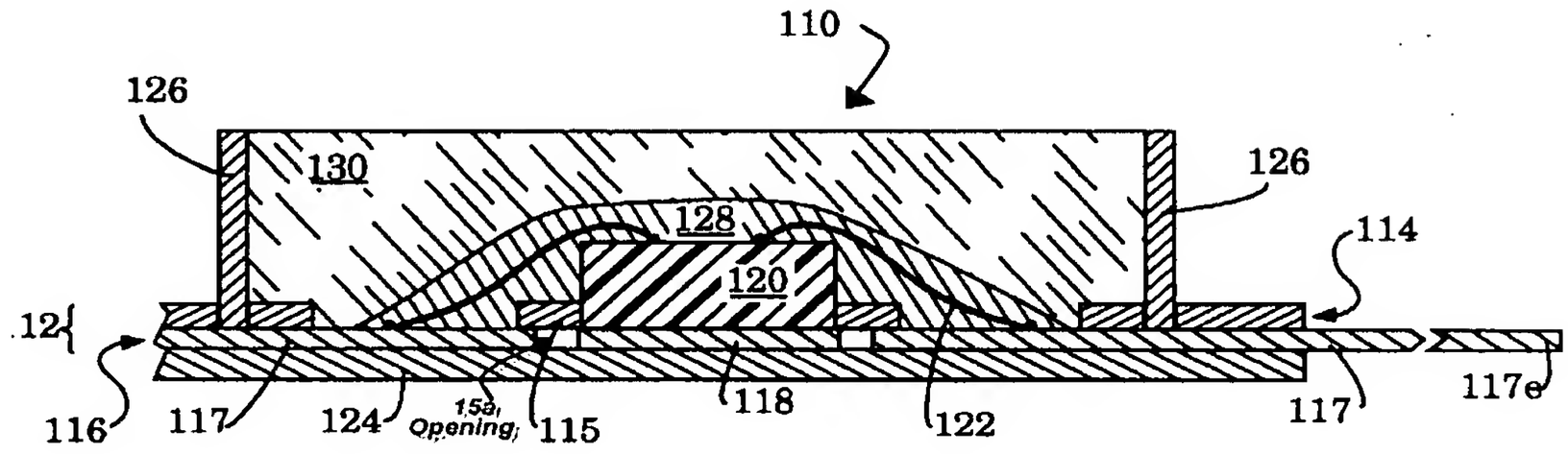
### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Long et.al. (5831836).

Regarding claim 1 Long et.al. discloses an integrated circuit structure (Figure 1 Element 110) comprising: an insulator Layer (Figure 1 Element 114) a pad (Figure 1 Element 118) comprising a conductive material (Figure 1 Element 116) on said insulator Layer (Figure 1 Element 114), said pad (Figure 1 Element 118) having a wirebond (Figure 1 Element 122) connection region and a probe pad region (Figure 1 Element 117) and an inspection mark (Figure 1 Element 115) between said wirebond connection region (Figure 1 Element 122) and said probe pad region ( Figure 1 Element 117) wherein said inspection mark (Figure 1 Element 115) comprises an opening(See figure below i.e. Figure 1 Element 115a ) in said insulator Layer (Figure 1 Element 114) that is filled with said conductive material (Figure 1 Element 116).




Regarding claim 2 as applied claim above, Long et.al. discloses further comprising a polyimide Layer (Column 3 paragraph 3 lines 21-31) above said conductive material (Figure 1 Element 116), said polyimide having a second opening, wherein said pad (Figure 1 Element 117) is exposed through said second opening. (See Column 3 paragraph 3 lines 21-31]

Regarding claim 3 as applied claim above, Long et.al. Wherein said inspection mark (Figure 1 Element 115) opening is formed above an insulating region (Figure 1 Element 114) of said wiring layer (Figure 1 Element 128).

Regarding claim 4 as applied claim above, Long et.al discloses, wherein said conductor comprises a refractory metal. [See Column 9 paragraph 9 lines 65-76]

Regarding claim 5 as applied claim above Long et.al discloses, wherein said conductor comprises one of aluminum, titanium, and alloys thereof. [Column 5 paragraph 2 lines 7-23]

Regarding claim 6 as applied claim above Long et.al discloses, wherein said inspection mark (Figure 1 Element 115) is visible form an exterior of said integrated circuit structure (Figure 1 shows a cross-sectional representation of a wire-bond integrated circuit package of this invention).

Regarding claim 7 as applied claim above Long et.al discloses, wherein said inspection mark (Figure 1 Element 115) delineates where probe inspection marks (Figure 1 Element 115) are permitted on said pad (Figure 1 Element 118). (See figure in claim 1)

3. Claims 8-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Howell (6,605,526 B1).

Regarding claim 8 Howell et.al discloses, an integrated circuit structure (See the abstract) comprising a wiring Layer (Figure 2 element 11) below said insulator Layer (Figure 2 element 12) said wiring Layer (Figure 2 element 11) comprising a conductor wire [Column 1 paragraph 5 lines 41-55] an insulator Layer on said wiring Layer (Figure 2 element 11) a pad [column 1 paragraph 3 lines 21-31] comprising a conductive material (Figure 2 element 14) on said insulator Layer (Figure 2 element 12) said pad [column 1 paragraph 3 lines 21-31] having a wirebond (element 31) connection region and a probe pad region[column 1 paragraph 3 lines 21-31] an inspection mark (Figure 2 element 20) between said wirebond (Figure 2 element 31) connection region and said probe pad region [column 1 paragraph 3 lines 21-31], wherein said inspection mark (Figure 2 element 20) comprises an opening in said insulator Layer (Figure 2 element 12) that is filled with said conductive material [Column 1 paragraph 2 lines 14-21] and a contact through said insulator Layer(Figure 2 element 12), said contact being adapted to electrically connect said conductor wire in said wiring Layer to said pad [column 1 paragraphs 3 lines 21-31], wherein said contact comprises said conductive material [Column 1 paragraph 2 lines 14-21].

Regarding claim 9 as applied claim above Howell et.al discloses, further comprising a polyimide Layer (Element 14) above said conductive material Figure 2 Element 20), said polyimide (Element 14) having a second opening (See figure 2 Element 30), wherein said pad [column 1 paragraphs 3 lines 21-31], is exposed through said second opening (See figure 2 Element 30).

Regarding claim 10 as applied claim above Howell et.al discloses, wherein said inspection mark (Figure 2 element 20) opening is formed above an insulating region (Figure 2 element 12) of said wiring Layer (Figure 2 element 11).

Regarding claim 11 as applied claim above Howell et.al discloses, wherein said conductor comprises a refractory metal. [See claim 10 of the reference used, i.e. a method of forming a connection to a conductor within an integrated circuit structure, said method comprising: defining a via through an exterior of said integrated circuit structure above a portion of said conductor while retaining a thin insulator on said portion of said conductor and attaching a wirebond material to said portion of said conductor with a heated capillary, by breaking through said thin insulator disposed on said portion of said conductor without a separate etch step]

Regarding claim 12 as applied claim above Howell et.al discloses, wherein said conductor comprises on of aluminum, tantalum, titanium, and alloys thereof. [Column 1 paragraph 3 lines 21-31]

Regarding claim 13 as applied claim above Howell et.al discloses, wherein inspection mark (Figure 2 Element 20) is visible from an exterior of said integrated

circuit structure. (See figure 2, it shows a cross-sectional representation of an integrated circuit package of this invention)

Regarding claim 14 as applied claim above Howell et.al discloses, wherein said inspection mark delineates where probe inspection mark (Figure 2 element 20) are permitted on said pad [column 1 paragraphs 3 lines 21-31].

Regarding claim 21 Howell et.al discloses, an integrated circuit structure (See the abstract) comprising a wiring Layer (Figure 2 element 11) below said insulator Layer (Figure 2 element 12) said wiring Layer (Figure 2 element 11) comprising a conductor wire [Column 1 paragraph 5 lines 41-55] an insulator Layer on said wiring Layer (Figure 2 element 11) a pad [column 1 paragraph 3 lines 21-31] comprising a conductive material (Figure 2 element 14) on said insulator Layer (Figure 2 element 12) said pad [column 1 paragraph 3 lines 21-31] having a wirebond (element 31) connection region and a probe pad region[column 1 paragraph 3 lines 21-31] an inspection mark (Figure 2 element 20) between said wirebond (Figure 2 element 31) connection region and said probe pad region [column 1 paragraph 3 lines 21-31], wherein said inspection mark (Figure 2 element 20) comprises an opening in said insulator Layer (Figure 2 element 12) that is filled with said conductive material [Column 1 paragraph 2 lines 14-21] and a contact through said insulator Layer(Figure 2 element 12), said contact being adapted to electrically connect said conductor wire in said wiring Layer to said pad [column 1 paragraphs 3 lines 21-31], wherein said contact comprises said conductive material [Column 1 paragraph 2 lines 14-21].

Regarding claim 22 as applied above in claim 8 Howell et.al discloses, further

comprising a polyimide layer (Element 14) above said conductive material (Figure 2 element 14), said polyimide having a second opening (See figure 2 Element 30), wherein said pad [column 1 paragraph 3 lines 21-31] is exposed through said second opening (See figure 2 Element 30).

Regarding claim 23 as applied above in claim 8 Howell et.al discloses, wherein said inspection mark opening (Figure 2 element 20) is formed above an insulating region of said wiring layer (Figure 2 element 11).

Regarding claim 24 as applied above in claim 8 Howell et.al discloses, where the conductor is comprises a refractory metal. (See the field of the invention, Refractory metals are a class of metals extraordinarily resistant to heat, wear and corrosion)

Regarding claim 25 as applied above in claim 8 Howell et.al discloses, wherein said conductor comprises one of aluminum, tantalum, titanium, and alloys thereof. [See Column 1 paragraph 3 lines 21-31]

***Response to Arguments***

Applicant's arguments filed 01/26/2007 have been fully considered but they are not persuasive.

First, Applicant argues that" Howell fails to teach the claimed feature of "a pad comprising a conductive material on said insulator layer, said pad having a wirebond connection region and a probe pad region" as defines in independent claims 1,8 and 21)

In response to the above argument, Applicants attention directed to Figure 9, i.e. heat, pressure, and spark are exerted upon the sacrificial material 80 during the formation of the wire bond 31 through the capillary 30. As shown in FIG. 9, this heat

and pressure break through the sacrificial material 80 to allow a high-quality connection between the uncorroded wiring 11 and the wirebond 31. [column 1 paragraphs 3 lines 21-31]

Second, Applicant argues "Long fails to disclose the claimed feature of "a pad ... on said insulator layer, said pad having a wirebond connection region and a probe pad region" as defined in independent claims 1, 8, and 21"

In response to the above argument, Applicants attention directed to Figure 1, i.e. when a die attach pad 118 is present, the upper patterned insulative layer 114 includes a surface 115 which "bridges" between the die (die are encapsulated to form the black chips that are then placed on a module) attach pad 118 and the electrical leads 117.

## *Conclusion*

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Abiy Getachew whose telephone number is (571) 272 6932. The examiner can normally be reached on Monday to Friday 8Am to 4:30Pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dean A. Reichard can be reached on (571) 272 1984. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Abiy Getachew
Examiner
Art Unit 2841

TUAN T. DINH
PRIMARY EXAMINER

A.G.
April 15, 2007